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Achieving Disaster Resilience through the Sri Lankan Early Warning system: Good practises of Disaster Risk Reduction and Management

SSL Hettiarachchi[a], S Weeresinghe[a]*

[a]*Dept. of Civil Engineering, University of Moratuwa, Moratuwa, Sri Lanka*

Abstract

A case study report of the good practices of the Sri Lankan Early Warning System (EWS) was prepared for the ANDROID Disaster Resilience Network funded by the EU Lifelong Learning Programme. The objective was to highlight good practices, identify gaps and useful recommendations (within an up-to-date and comprehensive context) to achieve disaster resilient governance. The EWS components; Infrastructure, Risk Knowledge (i.e. Hazard, Vulnerability and Risk Assessment), Preparedness and Early Warning Dissemination, Disaster Response and Coordination were scrutinised. These components were compared against the exemplary structure of a people-centred EWS to assess its efficacy in achieving disaster resilience. Since the 2004 Indian Ocean Tsunami was the first contemporary large-scale disaster faced by Sri Lanka, it lacked the legislative framework and institutional capacity to respond and only thereafter the integration of Disaster Risk Reduction (DRR) was observed. The importance of training was demonstrated within risk knowledge, preparedness and early warning dissemination, and disaster response and coordination. Thereby training is considered crucial in achieving a progressive, people-centred EWS. However it can be consolidated through joint resource utilisation (particularly personnel) between organisations and creating a Continuing Professional Development (CPD) certification system. There has been considerable progress in integrating DRR into development at all levels, which is a key measure in achieving disaster resilience. It was notably observed in achieving disaster resilient development, climate change adaptation and DRR was integrated despite a general tendency to be polarised in other areas. Despite some existing projects there is a need for greater government and private sector engagement in ecosystem-based DRR. Finally to achieve a disaster resilient Sri Lankan EWS, risk transfer measures require further evaluation. The emergence of some disaster risk financing and insurance is observed but issues, such as assuring applicability to a local context and scientific, evidence-based underpinning, need to be addressed.

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Key words: Disaster Risk Reduction; Disaster Resilience; Preparedness; Early warning dissemination; Governance

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*Corresponding author. *Email address:*
shayani_w@outlook.com

1. Introduction

The University of Moratuwa as an international partner contributed to the ANDROID network a case-study report of the Sri Lankan Early Warning System (EWS) which highlights good practices, gaps and useful recommendations to promote disaster resilient local and national governance. The report aimed to give an assessment of its components from inception, through legislation and roles of stakeholder institutions within current practices. Since the 2004 Indian Ocean Tsunami (IOT) was the first contemporary large-scale disaster faced by Sri Lanka, it lacked the legislative framework and institutional capacity to respond at the time and only thereafter the need to recognise disaster risk was observed.

2. Infrastructure of Disaster Risk Management

The recommendations from the Parliament Select Committee (PSC) on Natural Disasters (which formed immediately after the 2004 IOT) and the *Disaster Management Act No.13* (2005) are the basis of the current disaster management approach (Ministry of Disaster Management, 2013). The National Council for Disaster Management (NCDM) is a high level body, chaired by the President, which provides policy guidance and monitors implementation of the Act, including coordination of all related ministries and agencies (Figure 1; Ministry of Disaster Management, 2013; UNDP, 2007). The *National Disaster Management Policy* (most recently updated in 2013) elaborates the Act using an integrated approach, the 'Total Disaster Risk Management System' (UNDP, 2007).

Despite progress towards decentralisation in the *National Disaster Management Policy* through district plans and committees, there is still central control which has caused "layers of administration" in the Provincial Councils (UNDP, 2007). The *Road Map for Disaster Risk Management I* is considered a significant achievement of institutional consultation and coordination (UNDP, 2007).

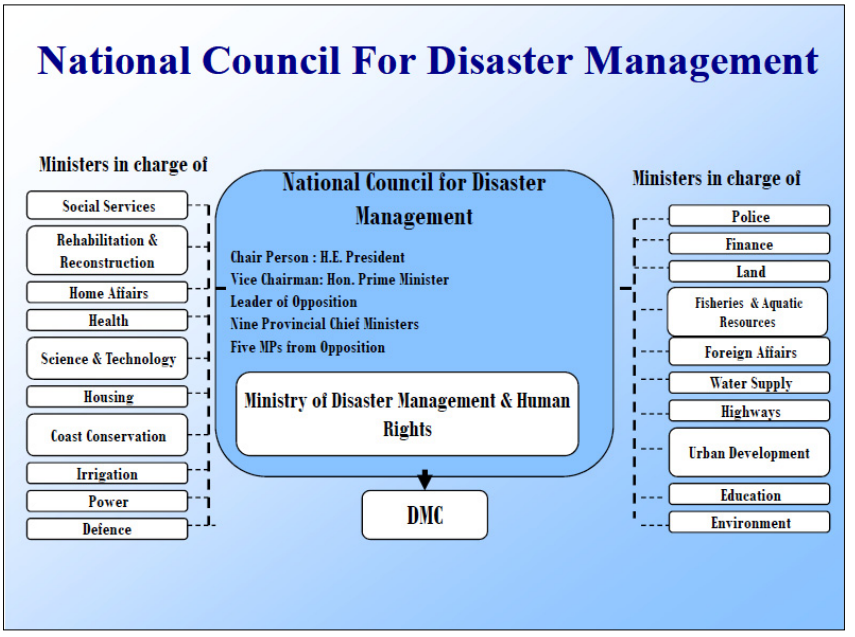

Fig. 1. Structure of the National Council for Disaster Management (Source: Kodippilli, 2013).

The National Disaster Management Coordinating Committee (NDMCC) is a national platform in line with the Hyogo Framework to coordinate stakeholder agencies. It provides a useful forum with monthly meetings establishing the current status regarding disaster management and proposes new areas of investigation (pers. Account). The Disaster Management Centre (DMC) under the Ministry of Disaster Management assists the NCDM to ensure conformity of all disaster management plans to overall policy (UNDP, 2007).

3. Risk Knowledge: Hazard, Risk and Vulnerability Assessment

Databases relating to all disasters have currently been developed using DesInventar methodology (UNESCAP, 2009; UNDP, 2007). However the 2004 IOT set a precedent as high risk tsunami zones and tsunami frequency within the different parts of the region was poorly known (UNESCAP, 2009). Thereafter development of regional guidelines was initiated in July 2007 with the tsunami risk assessment guidelines adopted in April 2009 (UNESCAP, 2009).

The 2009 Regional Workshop (initiated by the Global Risk Identification Programme (GRIP) of the UNDP Bureau for Crisis Prevention and Recovery) shared country experiences of developing hazard and risk profiles and risk assessment, followed by a National Workshop for Sri Lankan experts and stakeholder agencies to finalise line agencies' methodologies through extensive consultation (DMC, 2009).

The national 'Hazard Profiles of Sri Lanka' was the first step to develop the national Risk Profiles - with Risk Profiles for five major hazards developed (DMC, 2009). It would be beneficial if multi-hazard risk assessments for key sectors were made available to determine the placement of resources (UNESCAP, 2009).

A vulnerability atlas is to be established at the scale of 1:50,000 which will be updated every 10 years (DMC, 2006). Sri Lanka Red Cross conducts successful community based vulnerability assessments using a participatory approach (Chandraratne and Mohottige, 2013). Initially conducted in tsunami affected districts, it expanded into districts affected by landslides and floods from 2007 onwards (Chandraratne and Mohottige, 2013).

4. Achieving preparedness and early warning dissemination to ensure human security

Achieving preparedness and early warning dissemination is vital since an estimated 2-3 million live beyond communication loops or lack the resources to be adequately prepared for a natural disaster (UNDP, 2007). Among public awareness schemes, a National Safety Day was established by the DMC on the 26th December 2006 to commemorate the IOT (UNDP, 2007).

The current contingency plan is rehearsed every 3 months to ensure a timely, efficient and reliable response (UNDP, 2007). In response to a tsunami evacuation alert, an increased response capacity has been observed as the entire Eastern coastline was evacuated in 55 minutes (March 2006) to 90% of coastal communities being evacuated in 1.5 hours (April 2012) (ICG, 2012; UNDP 2007).

4.1 Early warning dissemination

A 24/7 Operations Centre is housed within the Department of Meteorology to receive alerts from regional and local institutes – complementarily local institutes have 24/7 operations centres for real time monitoring and reporting (ICG, 2012). However it is the Emergency Operations Centre (EOC) of the DMC which initiates early warning communication (UNDP, 2007).

UNDAC has advocated the capacity of the Police Communications Centre having managed 400,000 incoming calls despite its manual function and reflected by this demonstrable public confidence (UNDAC, 2011).

The Disaster and Emergency Warning Network (DEWN) is the first mass alert emergency warning system for Sri Lanka, controlled by the EOC of the DMC, public alerts will be issued to 'Dialog' phone network users through a 'cell broadcast' during potential disasters (DMC, 2009).

5. Disaster response and coordination

Disaster Management committees and sub-committees have been established regarding 1) Early warning dissemination 2) Search and rescue and evacuation 3) Shelter and relief management 4) Health and first aid 5) Water and sanitation 6) Patrolling and vigilance (UNDP, 2007).

The current Search and Rescue team was initiated through the decision of the Army with support from the other armed services, to provide dedicated troops to assist civil authorities in each district and this is formalised under the *National Disaster Management Plan 2009-2013* (UNDAC, 2011). Furthermore districts have members of the Department of Civil Security consisting of 36,000 paid personnel available to them (UNDAC, 2011). In the long term the establishment of Search and Rescue under a National Fire and Rescue service should be considered

(UNDAC, 2011).

5.1 Emergency/Disaster response services

The majority of the country is not covered by a fire service with only 22 of the 335 municipalities and an additional five planned in 2012 (UNDAC, 2011). Ambulance services are hospital-based, generally used as a transport service as opposed to an emergency response service but critically these private emergency services are made available to the public during a disaster (UNDAC, 2011).

5.2 Emergency health services

The *National Strategic Plan for Health Sector Disaster/Emergency Preparedness and Response in Sri Lanka* (2011) established clear organisational and coordination structures at National, Provincial and District levels (UNDAC, 2011). The Ministry of Health (Colombo) houses the Disaster Preparedness and Response Unit and has a satisfactory surveillance system – in addition to disease surveillance it ensures environmental, sanitation, hygiene and availability of safe water (UNDAC, 2011).

The Ministry of Health established Community Support Officers (CSOs) from volunteers in disaster-affected communities to ensure follow up of clients at the community level, assuring a reactive emergency health response.

5.3 Aid distribution and storage

The development of the Hambantota Port (services and industrial port), the Colombo South Harbour (new extension of the Colombo Port) and the Trincomalee Port ensures accessibility for international aid and avoids reliance on the Colombo Port as the main entry point for cargo (UNDAC, 2011). Also the new development of the Mattala Rajapakse International Airport in addition to the existing civilian international airport alleviates traffic (UNDAC, 2011).

The role of the Multi Purpose Cooperative Society (MPCS) has been advocated as excellent distribution points for aid deliveries due to their community reach (UNDAC, 2011). Private-public partnership should be encouraged to reduce dependence on international supplies and the need for stockpiling (UNDAC, 2011).

6. Achieving disaster resilience

Sri Lanka has exceeded the Millennium Development Goal in relation to water and sanitation coverage with 85.5% in 2011 and aims to reach 100% by 2020 – this is vital in providing reliable water and sanitations services to avoid water-borne disease outbreaks post-disaster (UNDAC, 2011). Timesaving tools such as an "environmental help-desk" within emergency response units, guidelines for solid waste management and for Rapid Environmental Assessments should be established to avoid equally harmful impacts post-disaster (IUCN, 2006). Following the 2004 IOT, rapid green and brown environmental assessments were successfully implemented through UNEP funding and followed by Rapid Environmental Assessments (IUCN, 2006).

The *National Climate Change Adaptation Strategy for Sri Lanka 2011-2016* recognises climate change adaptation is vital to disaster resilience; the first two strategic thrust areas focuses on national planning and development and secondly climate resilient, healthy human settlements (CCS, 2010). Also the National forum on "Climate Resilient Action Plans for Coastal Urban Areas in Sri Lanka" validated a national statement on climate resilient cities and supports climate change adaptation activities (UN-HABITAT, 2011).

Integrated Strategic Environmental Assessment has been implemented to incorporate disaster risk into development through the identification of ecologically sensitive areas for conservation and or ecotourism (Ranasinghe, 2011). Some pioneering urban development projects have been the UN-HABITAT "Disaster Resilient City Development Strategies for Sri Lankan Cities" and "UN-HABITAT Climate Resilient Action Plans for Coastal Urban Areas" (UN-HABITAT, 2012; UN-HABITAT, 2011). The latter aims to enhance multi-stakeholder resilience and culminated in a multi-purpose green belt, GIS-based Rapid Response System and disaster resilient, energy efficient, low-cost shelter adaptation training (UN-HABITAT, 2011).

7. Conclusions

The importance of training to maintain a progressive, people-centred early warning such as in Sri Lanka is evident. This is particularly observed within the areas of risk knowledge, preparedness and early warning dissemination and disaster response and coordination. It can be consolidated through joint resource utilisation (particularly personnel) between organisations and creating a Continuing Professional Development (CPD) certification system (Sugathapala, 2013).

Disaster management policy has been comprehensive but there remains a need for improved protocol and policy guidance regarding the evacuation of disabled persons as the disability prevalence in Sri Lanka is 6 – 12.6%

(UNDP, 2007). The integration of Disaster Risk Reduction (DRR) into development is demonstrated particularly within legislation. The *National Physical Plan* addresses adoption of non-structural and structural mitigation measures in planning and development activities (ADPC & DMC, 2009?). The *Draft National Policy for Disaster Management* (2013) promotes the incorporation of DRR into planning and implementation of rural, urban and regional development initiatives at a national level. However the integration of DRR into important planning legislation, such as the Town and Country Planning Ordinance and its amendment, is vital to ensure unification (UNDP, 2007). It would be beneficial if multi-hazard risk assessments were made available to key sectors for resource security (UNESCAP, 2009).

In 2008 the Priority Implementation Partnership (PIP) to mainstream DRR into the housing sector was initiated. It was proposed within the *Draft National Housing Policy of Sri Lanka* (section of Disaster affected Housing Reconstruction) to create a land bank for release during post-disaster, urgent reconstruction; to formulate a national settlement policy identifying hazard prone areas to encourage strict approval processes by Local Authorities and provide necessary infrastructure and programmes to prepare multi-storied housing (ADPC & DMC, 2009?). Furthermore its Technical Working Group provided technical support, a training programme and awareness programmes to the Kanthale Development Plan (ADPC, DMC & UDA, 2009?). Ultimately there has been fair progress to integrate DRR into planning and development but there remains a need to invest in ecosystem based DRR initiatives.

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